Policies & Procedures Manual

March 2009

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For More Information…
Please contact SanGIS at (858) 874-7000 or director@sangis.org

1.0 OVERVIEW

1.1 INTRODUCTION

The San Diego Geographic Information Source (SanGIS) is a Joint Powers Agency (JPA) of the City of San Diego and the County of San Diego and referred to in the remainder of this document as the City and County. The City and County of San Diego began working together on the development of a regional Geographic Information System (GIS) in 1984 under a 10-year program called the Regional Urban Information System (RUIS). Through RUIS, a regional landbase of over 150,000 roads and 900,000 parcels was created. RUIS successfully implemented several mapping standards and procedures through the cooperation of multi-department committees. GIS maintenance and analytical tools were developed and a distributed network was installed to facilitate access to both the centralized and distributed geographic databases.

When the 10-year RUIS agreement expired, the City and County called for the development of a strategic plan to determine the future direction of their joint GIS efforts. Interviews with County and City management and staff led to the development of the following recommendations documented in the RUIS Strategic Plan:

- Formalize City/County partnership
- Establish a regional data warehouse
- Centralize and control basemap maintenance
- Simplify and standardize data access subscriptions
- Centralize, standardize, and reduce the cost of public access
- Establish strategic partnerships
- Increasing funding from other sources
- Continue to use experienced technical resources

Due to the desire of the City and County to formalize and continue their commitment to a common GIS and to strive to recover some of the on-going costs, the SanGIS joint powers agency was approved by the County Board of Supervisors and the City Council in June, 1997, under Government Code 6500. The creation of SanGIS is the City and County's recognition that a GIS is never complete. GIS tools and data are now used for decision-making and in the performance of many government functions such as crime analysis, emergency response, service vehicle routing, permitting, planning, decision support, and many types of data analysis. Without current and accurate data these processes become questionable or fail.

Since it was formed, SanGIS has grown to a staff of 13. We have assumed many important responsibilities as we have acquired the resources. Our mission has not changed but our methods of delivering on our goals have evolved with changes in technology and the development of our staff's technical abilities. The purpose of this document is to define and document our roles and responsibilities and those of the City and County as they relate to SanGIS.

1.2 SANGIS MISSION

> To maintain and promote the use of a regional geographic data warehouse for the San Diego region and to assist in the development of shared geographic data and automated systems which use that data.

1.3 SANGIS BUSINESS DOMAINS AND GOALS

1. **Regional Landbase Maintenance System**

    - Maintain SanGIS landbase at a 99% minimum integrity rate
    - Maintain SanGIS landbase within 90 days currency with Assessor
    - Ensure adequate backup and recovery of geographic databases
    - Utilize appropriate technologies and resources to proactively ensure data integrity

2. **Regional Geographic Data Warehouse**

    - House and host regional geographic information layers by implementing a range of technologies to define and maintain GIS server architecture
    - Engage in partnerships and outreach to encourage data sharing, ownership, and data warehouse publishing

3. **Regional Geographic Information Services**

    - Provide low-cost and no-cost access for member agencies to the complete warehouse of geographic digital data through networked servers
    - Provide no-cost access for public download of non-sensitive data
    - Provide low-cost standard map products through store front office
    - Promote access to SanGIS data utilizing innovative technologies

1.4 SANGIS DATA WAREHOUSE AND BUSINESS PROCESSES FLOW MAP

The process flow map for SanGIS's business domains are depicted in the following illustration, Figure 1. Each of the domains, their individual functions and operations, and interagency interactions are shown in this figure and discussed in subsequent sections of this manual.
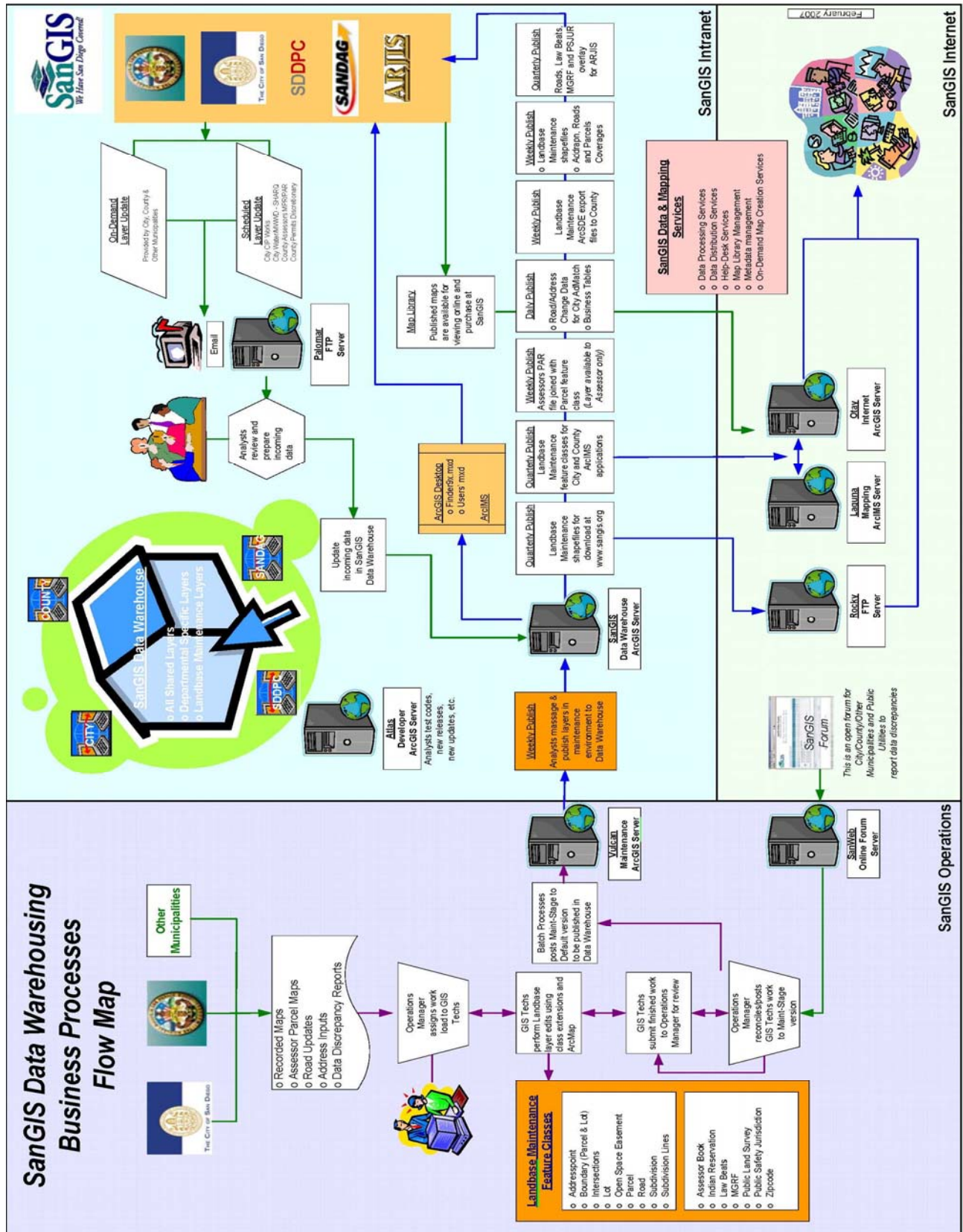
Figure 1. SanGIS Data Warehousing and Business Processes Flow Map

1.5 SANGIS ORGANIZATION

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                    ┌──────────────────┐
                    │   SanGIS Board   │
                    │   of Directors   │
                    └──────────────────┘
                              │
                    ┌──────────────────┐
                    │   Management     │
                    │   Committee      │
                    └──────────────────┘
                    ┌──────────────────┐
                    │    Executive     │
                    │    Director      │
                    └──────────────────┘
```

| Operations Manager | GIS Analyst | Data Services Manager |

GIS Analyst Trainee	GIS Consultant	Office Manager
GIS Analyst Trainee	Map Technician	Database Administrator
GIS Analyst Trainee	Map Technician	IT Administrator
	GIS Intern	Consultant(s) (as needed)
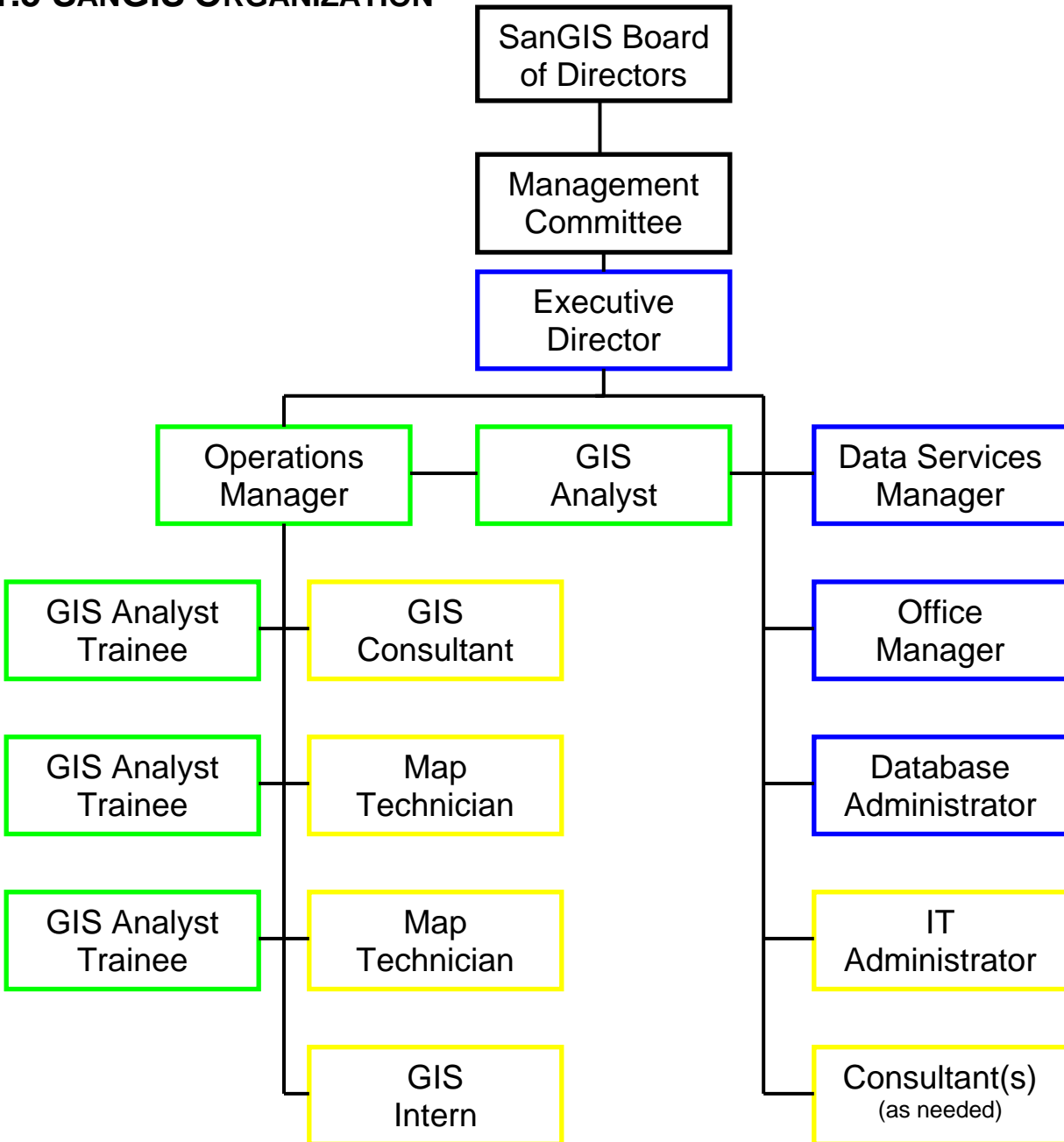
County of San Diego Staff:
Operations Manager
GIS Analysts
GIS Analyst Trainees

City of San Diego Staff:
Executive Director
Database Administrator
Data Services Manager
Office Manager

Note: Yellow boxes represent positions filled by consultants. Currently, the Database Administrator and the Executive Director are also filled by consultants.

1.6 SANGIS TECHNICAL ADVISORY BOARD

The SanGIS Board of Directors established the SanGIS Technical Advisory Board (STAB) soon after SanGIS was formed in 1997.

STAB Mission Statement
The SanGIS Technical Advisory Board (STAB) shall advise the SanGIS Executive Director on technical matters related to geographic data development and maintenance, data storage, and access; and standards for data, software, hardware, and network components.

STAB Membership
The City of San Diego GIS Manager and the County of San Diego GIS Manager serve as standing members of the STAB. The remaining members are appointed by the SanGIS Board. Each SanGIS Board Director appoints three (3) individuals from his or her member agency to serve as members of the STAB. Each appointee represents the entire agency, not his or her individual department. The San Diego Association of Governments (SANDAG) appoints one staff to serve as an ex-officio member of the STAB. The term for each appointed member is one year. The SanGIS Board of Directors and SANDAG may re-appoint members for consecutive years.

Meetings
The SanGIS Technical Advisory Board must hold at least one (1) regular meeting yearly. Minutes are kept for each meeting and made available to all interested parties. Five STAB members constitutes a quorum. Each STAB member including standing members and agency appointments shall have one vote. Ex-officio members and SanGIS support staff may not vote. In the case of a tie vote, the SanGIS Executive Director shall cast one vote.

Items to be considered by the STAB are presented to the Chairperson for inclusion in the agenda one week prior to the STAB meeting. Items may be submitted by non-STAB members. The Chairperson shall consider all agenda requests prior to presentation before the STAB and may reject a request. However, the STAB may place any item on the agenda by majority vote. The SanGIS Technical Advisory Board may designate a subcommittee to consider specific technical issues. The Chairperson shall appoint the subcommittee chairperson. The membership of subcommittees is open. Subcommittee recommendations will be brought before the STAB for official approval.

STAB meetings are regularly held at SanGIS, determined by the Advisory Board.

2.0 SANGIS PRODUCTS AND SERVICES

SanGIS Web Site

SanGIS maintains an Internet web site at www.sangis.org to support public access to our regional geographic data warehouse. The site includes an interactive map application focused on both general and specific public requirements. The Internet database is updated quarterly from the shared database. The SanGIS staff responds to emails addressed to webmaster@sangis.org daily and answers questions regarding use of the interactive mapping application and digital data.

SanGIS Home Page: www.sangis.org
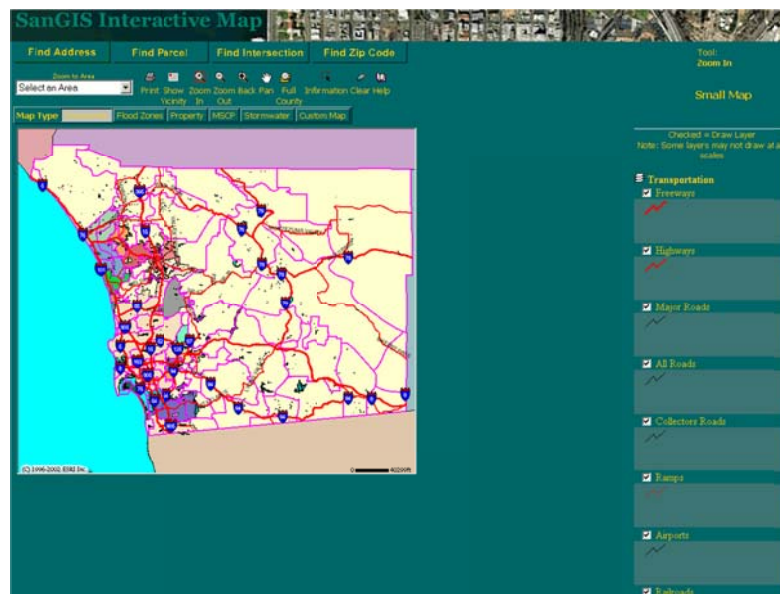
SanGIS Interactive Map Page

Map Products

SanGIS staff create maps on demand at very competitive prices and with immediate results. All maps are designed real-time with the client and are customized to meet their needs. These maps are available in 5 sizes. Most SanGIS maps cost $15 to $65.   An additional $10 to $15 is charged depending on the map size for an aerial photo on these plots. We also provide re-prints from our website's Map Library for $35 each. The cost for this service is cost-recovery based. Detailed costs of this and our other services are provided in Appendix A.
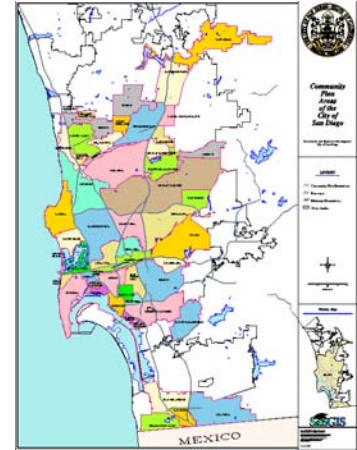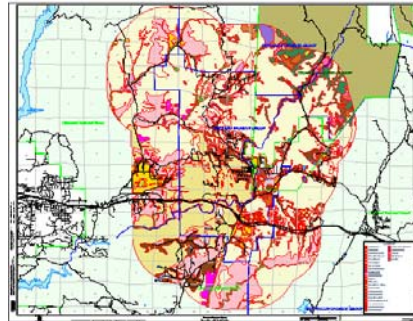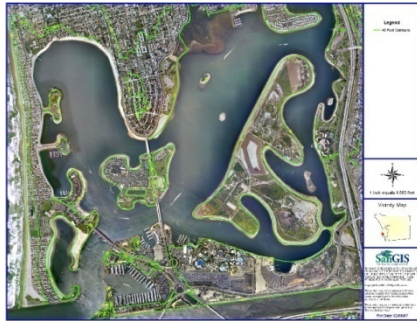
Sample Map Products

FTP Data Download

This data is available for free via a download through the SanGIS website. About half of the geographic data in the warehouse is available for download. The only data that is unavailable for download are data that our member agencies have deemed sensitive or data protected by copyright or available from other websites, such as SANDAG's (www.sandag.org).

Data CD/DVD Products

SanGIS can also provide digital data or map products on CDs. The downloadable data from the FTP site can also be purchased on DVD. The cost for these services are cost-recovery based.

Project-Specific Data Extracts

Staff creates data extracts for clients as defined by various project boundaries such as following the corridor of a street. Detailed costs of this and our other services are provided in Appendix A.

Orthophoto Products

City of San Diego high-resolution black and white orthophotography are available to print on store front requested maps or as an extract.

Public Access PC

The SanGIS lobby provides a public access PC that allows free viewing of our data warehouse using ArcGIS V9.x software. The PC is available during regular business hours and provides a very cost-effective and efficient method to view and query data and to make maps. Clients using the public access PC may make their own maps at half of the standard prices.

Other Support

SanGIS is frequently contacted by public agencies and consultants for background and technical information concerning the data warehouse layers and GIS. Our staff gives interviews, deliver presentations, and supply SanGIS materials to support GIS inquiries.

3.0 MEMBER PRODUCTS AND SERVICES

SanGIS Members are the City of San Diego and the County of San Diego

3.1 DATA MAINTENANCE

Regional Landbase Maintenance System
SanGIS maintains the landbase attributes and coordinate geometry for the entire San Diego County region. The landbase is comprised of the land records and roads network. Land records encompass features of lots, parcels, and open space easements. Road network encompasses features of road centerlines, intersections, and block ranges.

Newly recorded subdivision parcel maps, Assessor Parcel Maps, and other recorded or approved documents and drawings are supplied to SanGIS daily or weekly for digital entry. The timeliness of document receipt by SanGIS is dependent on the type of document and the supplier. Digital entry work is performed Monday through Friday and updates are posted to the data warehouse each weekend. Attribute updates will also be made daily as new information is received.

Zip Code Maintenance
Updates to the regional zip code layer are made based on source documents received periodically from the United States Postal Service. This work is performed as the changes are received by SanGIS.

Master Geographic Reference File (MGRF) Maintenance
The MGRF is derived from the federal census boundaries. Updates to the MGRF boundaries are made as necessary when road or land record adjustments occur during the maintenance process. Updates are usually posted weekly to the data warehouse. The MGRF is a restricted access file.

Departmental Data Maintenance
SanGIS staff occasionally provides map layer maintenance support to City or County departments. We perform maintenance on the following layers: Law_Beats, Indian_Reservations, Public_Land_Survey, Jur_Public_Safety and the Assessor_ Books.

Other Data Maintenance
SanGIS staff maintains several digital layers in the absence of other owners. Examples of these orphan layers include schools, libraries and hospitals. This work is done as time permits but usually annually in the summer.

Landbase Error Resolution
SanGIS staff completes corrections to roads, parcels and other landbase features based on reports from member agency staff, clients, the public, and via the SanGIS on-line Forum. Changes are not made unless verified on official documents or by qualified staff. This work is performed on demand (by order of priority) and the corrections are posted weekly to the data warehouse.

Data Clean-up Programs

Data clean-up projects are launched when deemed necessary to correct error patterns or to enhance service. Examples include private roads, orphan parcels, boundary line type errors, road classifications, and other road clean-up based on field checks by public safety agencies. This work is done as time permits.

3.2 DATA PUBLISHING

Data Warehousing

SanGIS staff gathers and manages data from member agencies in the SanGIS data warehouse. This warehouse is accessible by all member departments and serves as the central warehouse for geographic data for the City and County. The SanGIS data warehouse includes ArcGIS V9.x and ArcSDE data server, *SanGIS*. Metadata must be supplied to SanGIS with the data layer prior to publishing.

Data Acquisition

SanGIS acquires digital data from other sources and publishes it to the data warehouse. This includes private company data such as the Thomas Brothers page and grid layers as well as arrangements with SANDAG and other public agencies. SanGIS also participates in data partnerships such as the Countywide orthophotography programs on behalf of its member agencies.

Metadata Management

Previously, documentation of our many geographic data layers was the responsibility of SanGIS. Metadata based on information supplied by the department or agency responsible for maintenance of the data was maintained in an Access database and published in digital format periodically. The metadata is now required with the data layer in an XML file completed by the department/agency supplying the data. A Metadata Requirements document has been created to assist with completing the metadata. An online copy is located on the SanGIS website in SanGIS Documentation/Business Process.

3.3 DATA ACCESS

License Management

SanGIS provides the Oracle and SDE server and client licenses necessary to access the SanGIS Oracle/SDE database. To access the SanGIS data warehouse, members need only to request an Oracle account. There is no charge for set-up, usage, documentation, and phone support. The County has put in place a server that currently County staff access. Data from the SanGIS warehouse is replicated to the County server each weekend. The Oracle and SDE server and client licenses necessary to access the County Oracle/SDE database is furnished by County staff or their IT consultant. The City is in the process of setting up similar access for City departments.

Wide Area Network

SanGIS provides the high-speed (T1) wide area network circuits to make the data warehouse available to member agencies online. There is further information about the SanGIS Data Environment later in this document.

3.4 OTHER MEMBER SUPPORT

Mapping

While many of our member departments are equipped to create their own maps and to support public requests for maps, others are not. SanGIS creates maps for member agencies on-demand and time-permitting. SanGIS also re-prints maps that are supplied by member departments to the Map Library and provides mapping support to departments that are just getting started in GIS.

GIS Support and Training

SanGIS staff regularly provides free GIS support to City and County staff in subjects such as ArcGIS, SanGIS website, orthophotos and metadata.

Orthophoto and Data Extractions

SanGIS staff 'cut' CDs to support various departmental needs at no cost. An example is making CD/DVD copies of Mr. SID aerial orthophography.

Data Creation

Occasionally, SanGIS staff create data to support member departments or SanGIS functions. These tasks usually originate with a digital address file that is address matched to create a point layer. This work is done as time permits.

Support for Departmental Systems

Daily and weekly jobs, extract and reformat SanGIS data for use in departmental systems. Examples include extracting landbase maintenance feature classes for the County of San Diego and road & address files to the City of San Diego's Admatch system. SanGIS staff manage these processes.

Group Discounts

SanGIS may arrange discounts for software or data products through certain vendors.

User Group(s) Support

SanGIS staff provides support to ESRI's ArcGIS user group as well as to the City and County GIS user groups.

GIS Community Participation

SanGIS staff participates in several groups including the San Diego Regional GIS Council (SDRGC), the California Geographic Information Association (CGIA), the Urban and Regional Information System Association (URISA), San Diego imagery partnerships and the Southern California GIS Counties. These groups facilitate regional GIS cooperation.

SanGIS Online Forum

An online data forum is offered to discuss and explain how to use various map layers available through SanGIS. Errors found in the SanGIS database, troubleshooting, questions, bug tracking, and other related reports and questions are sent to the SanGIS web forum. (http://sanweb.sangis.org/forum/)

Newsletter

The SanGIS newsletter called "The Source" is produced on a regular basis and is distributed via email to all member agency users. The newsletter includes data warehouse updates, meeting announcements, project descriptions and technical advice. The Newsletters are posted to the SanGIS website (http://www.sangis.org/Newsletter.htm)

Reporting

SanGIS produces a monthly report documenting tasks and services. This report details the number of maps produced, website support, phone calls, member support, and system availability. See Appendix C for sample reports.

4.0 STANDARDS AND PROCEDURES

4.1 REGIONAL DATA MAINTENANCE

4.1.1 Regional Landbase Maintenance Systems

Definition
SanGIS Regional Landbase Maintenance includes digital entry and update of road centerlines and block ranges, land (lot) polygons, Assessor's parcel polygons, subdivision boundary polygons, open space easement polygons, river lines, lake polygons and the associated attributes for each feature including addresses (City of San Diego only). Maintenance action is triggered by new mapping activity, changes to associated attributes or detection of errors in the existing database. The maintained landbase represents the cadastre, with a currency typically within 30 days of receipt of the map from the County Recorder for lots. For parcels, the currency is typically within 60 days of receipt of the notification from the Assessor. The lot representation shows lots as affected by right of way activity, the parcel representation shows the assessment parcels as defined by the Assessor.

In an effort to reduce duplication of effort, SanGIS and the Assessor exchange digital files. In the situation where the Assessor has received a digital submission, SanGIS awaits receipt of the file from the Assessor rather than using the map to do COGO entry. This process typically results in entry of the map within 15 days of receipt of the file from the Assessor. In some instances the Operations Manager may contact the Engineer of Record to request digital drawings of large (50+ lots) maps and after receiving these digital drawings will also forward them to the Assessors Office.

Source Documents
SanGIS uses source documents provided by member departments and/or the County Recorder including Subdivision Maps, Parcel Maps, Records of Survey, Certificates of Correction, Vacation, Dedication and Easement Drawings, Lot Line Adjustments, Caltrans Layout, Monumentation and Relinquishment maps, private driveway exhibits, road name exhibits, block range exhibits, situs address exhibits, and assessor parcel maps. SanGIS acquires recorded source documents from the County recorder. SanGIS inputs source documents that do not record or that are recorded as an exhibit to a deed or other instrument only if provided by the member agencies. SanGIS does not perform any deed research. Unmapped lots are not represented in the Land layer. Deed activity may be reflected in the parcel layer based on assessor interpretation. The use of source documents is limited as follows:

   a) Vacation and Dedication Drawings: Only drawings referencing street dedications, street vacations, pedestrian and non-motor vehicular right-of-way, and access rights relinquished and revested will be utilized for landbase maintenance. These drawings must be recorded in the case of private properties or officially approved by the member agency (City Engineer or County Surveyor) in cases regarding public property.

b) <u>Lot Line Adjustments</u>: Only plats and map waivers graphically referencing lot line adjustments and officially approved by the member agency, (City Engineer or County Surveyor) will be used as a source document for landbase maintenance.

c) <u>Certificate of Correction</u>. Only documents referencing changes, and minor amendments to maps affecting geometry and street name changes, as shown on a previously recorded map will be utilized for landbase maintenance.

d) <u>Records of Surveys (ROS)</u>. Records of Survey referencing CalTrans right-of-way, corrections to existing source documents as listed above, and other previously recorded land documents, unmapped lots, superior court cases, and City of San Diego land surveys MAY be used in landbase maintenance. (Only if the ROS is referenced to NAD 83 or better data)

Digital Input Procedures

The standard Digital Input procedures adopted through the RUIS program and documented on page 7.4 of the RUIS Standards Manual are used for the inputting of the Source Documents into the landbase. Digital map submissions may be applied to the landbase when supplied by the County Recorder or by a member department in a format useable by SanGIS. SanGIS enters all other landbase updates from source documents using Coordinate Geometry (COGO) entry methods. This results in a database spatial accuracy of +/- 0.1 foot. Most maps processed through the County or City of San Diego are required by local ordinance to show two coordinate ties from existing survey control monuments to the map boundary. <u>However, not all the other incorporated cities require a coordinate tie on their maps. Consequently, the entry of some of the incorporated City maps may result in a less accurate spatial accuracy</u>.

The location of new subdivision and parcel maps entered by COGO from coordinate ties shown on the map shall hold. All older surrounding lot, parcel and road centerlines are moved to join the newer lines. This adjusting cleanup is done manually, one line at a time. No all encompassing adjust function is used. Only properly trained landbase maintenance technicians do the adjusting cleanup work. Specific COGO procedures are as follows:

a) Perform a traverse closure of the NAD 83 ties and boundary of document and validate control, and basis of bearings. The closure of the NAD 83 ties and boundary that form a closed loop shall close within 0.02'.

b) Determine grid boundary coordinate from shortest NAD 83 tie.

c) The boundary traverse closure must close to within 0.02'.

d) Internal geometry for centerline, lots and right-of-way, must be consistent with boundary geometry to within 0.02'.

The parcel maintenance process includes additional standards. For parcels created by maps, the lines are copied from the lots as they have been input into the lot layer;

therefore the standards outlined above are used. For parcels created by deeds or other source documents, the input is based on information shown on the Assessor maps. If necessary, the supporting documents will be downloaded from the County of San Diego's Webxtender Web page via VPN or requested from the County's Assessor Officer (for older documents).

Additional Road Standards
   a)   In the process of adding or unsplitting road segments, SanGIS uses Census, Municipal, Public Safety Jurisdiction and Fire Demand Zone (FDZ) layers as background layers. Roads are not unsplit where these boundaries intersect unless otherwise agreed.

   b)   SanGIS does not delete any road segments that are freeways and have a freeway alias attached until member agency's public safety departments have been notified.

Additional Parcel Standards
For parcels created by deeds or other non-map source documents, the input is based on information shown on the Assessor maps. If necessary the supporting documents are downloaded from the County's Intranet or requested from the Assessor.

Attributes
Geographic feature attributes are captured and stored in the SanGIS database during map entry including COGO, lot, road and general subdivision attributes as follows:

   a)   COGO attributes including distances, bearings, and curve data (Delta, Radius and Arc Length).

   b)   Lot attributes including lot number, descriptor, and type code.

   c)   Document attributes including document type, number, suffix, work order, work order ID, recording date, recorded indicator, and closure X,Y values.

   d)   Road centerline attributes including road segment, road name20, road name30, full road name, suffix, direction, road ID, absolute low and high address, right high and low address, left high and low address. Standard default values are entered for segclass, one way, speed and fire drivability attributes.

   Note: Parcel attributes are provided weekly by the Assessor and joined to SanGIS parcel polygons for publication to the data warehouse. Parcel attributes other than APN are not maintained by SanGIS.

Addresses
SanGIS is responsible for entry of new site addresses and for corrections to existing addresses for the City of San Diego. This task also includes maintaining the relationships between addresses, lots, parcels and road segments per the SanGIS data model.

Addresses for the County unincorporated area are periodically supplied to SanGIS by the County Department of Planning and Land Use and loaded into the SanGIS databases.

Annotation
SanGIS supports all annotation levels historically maintained and defined in the previous RUIS Standards, including street names, block ranges, addresses (City only), map numbers, map names (City only), lot numbers and assessor parcel numbers (APN). Note: Lot numbers are "feature linked" and are annotated for all new lots.

Source Document Errors
SanGIS staff will report within 24 hours to the appropriate member agency's designated land surveyor any Source Document errors (or landbase data errors preventing the update of the landbase with the source document) requiring resolution. In the event that a Source Document contains an error that must be resolved prior to inputting into the regional landbase, the member agency shall be responsible for providing resolution or returning the Source Document to the original approving land surveyor or registered civil engineer for correction. SanGIS will complete all work on the Source Document in error not dependent on land surveyor resolution.

Data Integrity and Accuracy Standards
The landbase is maintained, for data entered by SanGIS, with 100% of features represented and 99% accuracy on feature attribution. The spatial accuracy of the landbase will be maintained, for the data input by SanGIS, to the following standards based on the coordinate system of the source document:

Source Document Coordinate System	Spatial Accuracy Standard
NAD 83	0.1' at 95% confidence level
NAD 27	5' at 95% confidence (consistent with existing map)
Local	21' at 95% confidence (consistent with existing map)

Quality Control
SanGIS performs the following quality control processes for the landbase:

a)   The SanGIS Operations Manager performs Quality Assurance checks on landbase maintenance versions and then reconciles and posts the new data on the GIS Maintenance and Data Server, *Vulcan*.

b)   A weekly, automated process creates a database of all Assessor's Master Property Record (MPR) APNs that do not exist in SanGIS. This database is used as a reference to make corrections.

c)   An online query is performed each week to identify parcels in the SanGIS database that do not match the MPR. These parcels are flagged for correction. Assessor's Map Books are used as a reference for these corrections.

d)   Periodic automated processes are executed to check the integrity of road data.

e) A bi-annual validation of Parcels X,Y location fields will be run to find, fix, and update any 'odd' shaped parcel's XY fields based off centroid locations. Odd shaped parcels' centroid locations may fall outside the parcel boundaries and therefore cause the auto-creation of parcel addresses to get created outside their related parcel. These odd shaped parcels' XY location fields are updated with the parcel's label centroid location which is always inside the parcel's boundaries. This process cannot be done automatically during parcel maintenance because of an ESRI zipper tool related bug.

f) When appropriate, the SanGIS Operations Manager meets with officials from local cities to clarify mapping issues.

g) When necessary, the SanGIS Operations Manager performs field checks to determine the appropriate representation of real-world road features in the digital map.

h) When necessary, the SanGIS Operations Manager contacts the County Surveyor for map entry or error resolution assistance. The County Surveyor is the surveyor of record for SanGIS.

Maintenance Schedule

Standard Process	Digital map entry will be completed within 4 weeks of receipt of source documents from County Recorder (excluding time for correction of source document errors).
Expedite Process	Digital map entry will be completed within 10 business days of receipt of source documents from member agency (excluding time for correction of source document errors). Maps to be expedited will be delivered to SanGIS by the member agency with documentation to show that it is the *"First Known Last Final Map"* and will be clearly marked as "EXPEDITE". Work will not begin until road block ranges are provided for newly created road segments. SanGIS may request separate documentation for verification of "EXPEDITE" maps.
Digital Exchange Process	Digital map entry will be completed within 15 days of receipt of digital file from the County Assessor.

Data Storage and Access

The landbase is currently maintained on *Vulcan* Server using ArcGIS 9.3 (as of April 2009). Landbase Map Technicians edit the database using ArcGIS. ArcGIS desktop allows the creation of new features and the editing of existing ones to happen within a multi-versioned geodatabase. The maintenance database is accessible only to SanGIS internal staff. All new and revised landbase features are published to the SanGIS Data Warehouse on a weekly basis.

Other Landbase Features

The lake and river layers are not usually updated during the course of landbase maintenance. Corrections are made at the request of member agencies or subscribers.

4.1.2 Open Space Easement Maintenance

Definition
SanGIS Open Space Easement layer is currently maintained as a polygon feature class in ArcGIS Server. It represents dedicated open space as shown on recorded subdivision or parcel maps or by separate recorded documents. Biological and Recreational are separated from other types of open space.

Source Documents
Recorded subdivision or parcel maps or other recorded documents.

Digital Input Procedures
COGOed from source documents.

Attributes
The attributes for open space easements include source document, jurisdiction, and type.

Annotation
Polygons are annotated with either "OPEN SPACE" or "BIOLOGICAL OPEN SPACE".

Data Integrity and Accuracy Standards
Since maintenance of the SanGIS Open Space layer began around 1990, only those dedicated after that time are shown. There was an effort to add previously dedicated "Biological Open Space" and there are ongoing efforts to add previous easements as they are discovered. Accuracy of Open Space is not guaranteed due to these limitations.

Quality Control
The SanGIS Operations Manager performs Quality Assurance checks on Open Space maintenance versions completed by the Map Technicians and then reconciles and posts the new data on *Vulcan*.

Maintenance Schedule
Open Space is maintained as source documents are received. Also an effort is made to add any missing areas as they are discovered.

4.1.3 Zip Code Maintenance

Definition
The SanGIS zip code layer is currently maintained as a polygon feature class in ArcGIS Server. This layer represents the United States Post Office's 5-digit postal zones for San Diego County. Zip+4 is not supported by SanGIS. This layer does not include post office box zip codes that, like Zip+4, would be better represented by a point feature than a polygon.

Source Documents
The United States Post Office sends zip code changes to SanGIS periodically (usually once per year).

Digital Input Procedures
Due to the nature of the source documents used for maintenance of this layer, on-screen digitizing is used to enter changes and additions. Attention is given to align zip code polygon boundaries with road centerlines as appropriate.

Attributes
The only attribute stored with the zip code polygon layer is the zip code. During the publishing process, additional attributes acquired from USPS files are added to the database.

Annotation
No annotation is maintained for the zip code layer.

Data Integrity and Accuracy Standards
The zip code layer is maintained with 100% of features represented and 100% accuracy on feature attribution based on the USPS source documents made available to SanGIS.

Quality Control
All zip code maintenance work is checked for Quality Assurance by the SanGIS Operations Manager upon completion of edits by the Map Technician. The updated layer is passed to SanGIS data publishing staff that compares it to both the current layer and to data available from Thomas Brothers Maps. The metadata is checked by the data publishing staff for accuracy and completeness. The Operations Manager resolves any discrepancies or questions. The layer is updated in the data warehouse by the Database Administrator.

Maintenance Schedule
This layer is typically updated once per year. However, it may be adjusted based on landbase maintenance activity that may shift a road centerline.

4.1.4 Master Geographic Reference File (MGRF) Maintenance

Definition
The MGRF layer is currently maintained as a polygon feature class in ArcGIS Server. This layer represents the United States Census Bureau's 2000 census tracts for San Diego County. It was delivered to SANDAG as the TIGER file and rectified to match the SanGIS landbase through a joint SANDAG/SanGIS project. The census only changes every 10 years. The on-going maintenance is just to ensure that the polygon edges continue to match the associated road features. This is necessary because roads often move during the maintenance process.

Source Documents
Not applicable. Census MGRF maintenance is primarily a rectification task, adjusting the boundaries to align with landbase movements.

Digital Input Procedures
Copy road, parcel or other landbase feature to census layer to properly align MGRF edges.

Attributes
The only attributes stored with the census polygon layer are census tract and block. During the publishing process, additional attributes acquired from census demographic files are added to the database.

Annotation
No annotation is maintained for the MGRF layer.

Data Integrity and Accuracy Standards
Due to the lineage of census data, the integrity and accuracy cannot be guaranteed. Our maintenance work for MGRF is only rectification and should be considered best effort.

Quality Control
All MGRF maintenance work is checked for Quality Assurance by the SanGIS Operations Manager upon completion of edits by the Map Technician. The QA updated layer is passed to SanGIS data publishing staff that compares it to the current layer and to the roads layer, checks the metadata for accuracy and completeness, and then passes it to the Database Administrator for publishing.

Maintenance Schedule
This layer is typically updated quarterly. However, it may be adjusted based on landbase maintenance activity that may shift a road centerline.

4.2 DEPARTMENTAL DATA MAINTENANCE

4.2.1 Assessors Books

Definition
The Assessor Book layer is maintained as a polygon feature class in ArcGIS Server. This layer represents the division of Assessor's parcels into various books. This layer was developed by the County Assessor/Recorder/Clerk while parcel maintenance was their responsibility. Since the books align with the parcels and SanGIS is now responsible for regional parcel maintenance, SanGIS agreed to maintain the Assessor Book layer.

Source Documents
The Assessor notifies SanGIS when updates are made that affect book boundaries.

Digital Input Procedures
Copy parcel or road features to Assessor book layer to properly align book boundaries with the SanGIS landbase.

Attributes
The Assessor Book Number and textsize attribute are captured for each polygon. The textsize is S (small), M (medium) or L (large) depending on the polygon size.

Annotation
No annotation is maintained for this layer.

Data Integrity and Accuracy Standards
Rectified to SanGIS parcel layer.

Quality Control
Assessor Book maintenance work is checked for Quality Assurance by the SanGIS Operations Manager upon completion of edits by the Map Technician. The QA updated layer is passed to SanGIS data publishing staff that compares it to the current layer and to the parcel layer prior to the Database Administrator publishing it.

Maintenance Schedule
Assessor Book boundary changes are made annually, usually in May or June.

4.3 OTHER DATA MAINTENANCE

4.3.1 Law Beats

Definition
The law beat layer is maintained as a polygon feature class in ArcGIS Server. This layer represents the law beats for the law enforcement agencies that are members of the Automated Regional Justice Information System (ARJIS). This layer was developed by SDDPC for ARJIS. SanGIS maintains this data under contract to ARJIS.

Source Documents
The source documents vary by jurisdiction. Most input is received via fax or email.

Digital Input Procedures
Copy parcel or road features to law beat layer to properly align beat boundaries with the SanGIS landbase. The beat boundaries do not always align with jurisdictional boundaries. A special public safety jurisdiction layer (JUR_PUBLIC_SAFETY) is generated from this layer.

Attributes
Law beat attributes include beat number, division, service area, jurisdiction, responsible agency, comments, beat name, agency beat, and community code.

Annotation
No annotation is maintained for this layer.

Data Integrity and Accuracy Standards
Rectified to SanGIS road, parcel and/or municipal layers.

Quality Control
Law Beat maintenance work is checked for Quality Assurance by the SanGIS Operations Manager upon completion of edits by the Map Technician. The updated layer is passed to SanGIS data publishing staff that compares it to the current layer prior to the Database Administrator publishing it.

Maintenance Schedule

This layer is typically updated quarterly. SanGIS attempts to complete all requested changes prior to the quarterly DIME file creation for ARJIS.

4.3.2 Public Safety Jurisdiction

Definition

The public safety jurisdiction layer is generated from the law beats layer using the jurisdiction code. This layer represents the jurisdictional boundaries used by law enforcement, which do not always match the political jurisdictional boundaries maintained by the Assessor from tax rate areas.

Source Documents

The source for this layer is the law beats coverage.

Digital Input Procedures

See law beats.

Attributes

The only attribute stored on this layer is code (jurisdiction code).

Annotation

No annotation is maintained for this layer.

Data Integrity and Accuracy Standards

See law beats.

Quality Control

See law beats.

Maintenance Schedule

See law beats.

4.3.3 Indian Reservations

Definition

The Indian Reservation layer is maintained as a polygon feature class in ArcGIS Server. This layer represents the Indian Reservation boundaries for San Diego County. This layer was developed by the Federal Bureau of Indian Affairs (BIA) and rectified to the SanGIS landbase by the County Department of Public Works. SanGIS subsequently assumed responsibility for this layer and performs updates only as directed by the County of San Diego Assessor.

Source Documents

Most Indian Reservation updates are received through Assessor pages, recorded documents or recorded maps.

Digital Input Procedures
Copy parcel features to Indian Reservation layer to properly align reservation boundaries with the SanGIS landbase.

Attributes
The attributes for this layer came from the BIA and are not maintained by SanGIS. The BIA website that previously supplied this data had been taken offline due to some legal action. The site returned online in May of 2008.

Annotation
No annotation is maintained for this layer.

Data Integrity & Accuracy Standards
Rectified to SanGIS parcels. Accuracy of reservation boundaries is not guaranteed due to the lineage of this data layer.

Quality Control
Indian Reservation maintenance work is checked for Quality Assurance by the SanGIS Operations Manager upon completion of edits by the Map Technician. The updated layer is passed to SanGIS data publishing staff that compares it to the current layer prior to passing the data to the Database Administrator for publishing.

Maintenance Schedule
Updated quarterly, as necessary.

4.3.4 Schools

Definition
The school layer is maintained as a point shape file. This layer represents the location of all public and private schools from kindergarten through college. This layer has been created multiple times by multiple departments. SanGIS created the recent version using information from the County Board of Education directory in 1999. SANDAG has since provided updates.

Source Documents
There is no one source for this data layer. SanGIS attempts to acquire updated information from the numerous school district web sites and from the phone book. The County Board of Education directory is also used for update reference.

Digital Input Procedures
This layer was created using address matching. Most school points align on road segments. Some have been moved to the school site based on orthophotography. Point updates and additions are completed on screen, currently using ArcView. Most updates

are placed at the school site if this can be determined from the orthophoto.

Attributes
SanGIS captured the attributes for this data layer from the County Board of Education directory.

Annotation
No annotation is maintained for this layer.

Data Integrity and Accuracy Standards
The school layer has the status of "orphan layer". No City or County department has direct responsibility for this data. SANDAG and/or SanGIS staff maintains it at "best effort" level.

Quality Control
The SanGIS data publishing staff, not the operations staff, completes school layer updates. Once updates are completed, a second data publishing staff reviews the updated layer and compares it to the current layer for consistency in attributes, etc. The metadata is checked for accuracy and completeness.

Maintenance Schedule
Each summer an attempt is made to update this layer using school district websites and the phone book. Errors and additions are also reported to SanGIS by City/County departments and by citizens using the data through our website.

4.3.5 Libraries

Definition
The library layer is maintained as a point shape file. This layer represents the location of all public libraries in San Diego County. This layer was created by address matching a list of addresses supplied to SanGIS by the County Library in 1999.

Source Documents
Periodically, we receive a revised list of libraries from our member agencies and updates are applied.

Digital Input Procedures
This layer was created using address matching. Most library points align on road segments. Some have been moved to the library site based on orthophotography. Point updates and additions are completed on screen, currently using ArcView. Most updates are placed at the library site if this can be determined from the orthophoto.

Attributes
SanGIS captured the attributes for this data layer from the address list provided by the County Library.

Annotation
No annotation is maintained for this layer.

Data Integrity and Accuracy Standards
The library layer has the status of "orphan layer". No City or County department or agency has direct responsibility for this complete data layer although the City has information on City libraries and the County on County libraries. SanGIS staff maintains this layer at "best effort" level. The last update was furnished by San Diego County Library.

Quality Control
The SanGIS data publishing staff, not the operations staff, completes or reviews the library layer updates. It is compared to the current layer for consistency in attributes and the metadata is checked for accuracy and completeness.

Maintenance Schedule
Each summer an attempt is made to update this layer using library websites and the phone book. Errors and additions are also reported to SanGIS by City/County departments and by citizens using the data through our website.

4.4 LANDBASE ERROR RESOLUTION

SanGIS receives error reports from member agencies, clients and the public. SanGIS accepts error reports in various formats including SanGIS Online Forum (http://sanweb.sangis.org/forum/), phone calls, emails, faxes, marked up maps, etc. SanGIS verifies the correction against official documents and when necessary, with our public safety agencies prior to update. Most error corrections are made within the same week that they are reported so that the correction will be available in the SanGIS published (shared) environment the following Monday. When official documents conflict with the error report or when the change is not approved by our public safety agencies, SanGIS notifies the person who submitted the report that the correction will be delayed.

4.5 DATA CLEAN-UP PROGRAMS

SanGIS operations staff performs several on-going clean-up programs during the course of normal maintenance. These programs include road block range adjustments, adding common use names to private streets, reducing "continue" road segments, land layer attribute additions, and landbase spatial enhancements. Maintenance layers are also reconciled to align where required. For example, most law beats should align on roads, parcels align with municipal boundaries, etc..

4.6 DATA PUBLISHING

4.6.1 Data Warehousing

Definition
It is the mission of SanGIS to maintain a geographic data warehouse for its members and the public. The term "data warehouse" is used in many ways throughout the technology industry but the SanGIS data warehouse is really a data repository. Prior to the formation

of SanGIS, the County and City departments stored most GIS data on local servers. The basemap layers were stored centrally by RUIS. To make a map using data from various departments, a user might have to connect to 2 or more servers across a wide area network using NFS mounts. This method was problematic for various reasons. Access was often slow due to the bandwidth required for GIS data. Department operations may have been affected by server access from other departments. And most importantly, there were several issues with data access. For example, if a department was performing clean up on a data set or if they brought down their server for upgrades, other departments might use invalid data or may not be able to get to the data they needed.

SanGIS adopted a policy to separate operational data from published data in 1997. The published data is available on one central Oracle server accessible throughout the City and County network. Departments may choose the schedule for publishing their GIS data and may remove features or attributes for security reasons. SanGIS works with City and County departments to "massage" their operational data into published format. For example, the operational database may include only a code to indicate the type of feature so SanGIS may add a descriptive field. This process makes the data more user-friendly for departments that are not intimately familiar with another department's data.

Source Data
SanGIS automatically updates the data warehouse from our maintenance server on a weekly basis. This process provides current landbase data for all County and City GIS users. However, most of the over 450 map layers in the SanGIS data warehouse are not directly maintained by SanGIS. Data publishing arrangements are made with contributing departments. Some departments have automated the process by FTPing layers to SanGIS each month. Other departments supply SanGIS with updates annually. Many more databases are updated on-demand. SanGIS accepts data in either shape file or geodatabase format.

The County, the City and SANDAG, supply the majority of the source data. A few data layers are acquired and published by SanGIS through licensing agreements. Departments seeking data from other departments or agencies should make a request to SanGIS so that the data can be published for all members to access. Direct trades of data files are frowned upon because of the problems with determining an authoritative source for the data.

Update Procedures
All SanGIS maintained data layers are updated in the data warehouse through automated procedures. Roads, parcels, lots, easements, and addresses are updated weekly. Regularly scheduled department data updates are also automated. The automated updates are applied to the data warehouse on the day after the data is received. Annual and on-demand updates typically take 2 days but may take up to 2 weeks to process, depending on changes to the data structure, etc. SanGIS staff receives the data and does a visual check to compare the new data to the previous version. Fields are crosschecked between the old and new versions to see if any data structure changes have been made. Some layers are used to generate others. For example, the voter precinct layer is used to generate assembly, senate and supervisor districts.

Attribute Processing
SanGIS staff drops fields created by the software such as coverage –id and # fields. Staff also drops fields that the contributing department does not want published. Staff often drops operational fields that may be very important to the contributing department but mean nothing to the rest of the users. However, such fields will be retained if the contributing department or a user needs them. Additional descriptive fields are often joined to the data to make it more user-friendly. For some layers, only the features and a key are supplied and SanGIS joins the attributes from another source. The best example of this is the parcel layer. All parcel attributes are joined to the polygons from a file supplied to SanGIS by the County Assessor each week. Likewise, census demographic attributes are joined to the census tract and block polygons.

Data Integrity & Accuracy Standards
SanGIS is only directly responsible for the integrity and accuracy of the layers that it maintains. It is the responsibility of the contributing department to supply metadata describing the condition and permitted uses for each data layer. SanGIS will reject data inserts or updates that would prove confusing to the general user community but does not reject data because of dangles, slivers or other construction problems. We do communicate these problems to the contributing department and encourage them to improve their maintenance procedures.

Quality Control
For non-automated updates, SanGIS staff performs the steps described above. Once staff believes the layer is ready for update, the data layer is passed to another staff to check the data for standards and quality. Any questions or problems are resolved and a final version is sent to the SanGIS Database Administrator to update the database. The Database Administrator may reject the layer, change the layer name, or change the attribute names. These issues will be resolved between the SanGIS analyst and the DBA. The SanGIS analyst will notify the person who submitted the data once it is put in the SanGIS SDE database so they can access the updated data from the SanGIS database and know it is positioned to be replicated to their SDE database.

Security
Layer and field security are available through Oracle/ArcSDE. Some departments have published their GIS data to SanGIS but limited access to only their own department or to a small set of users. Contact SanGIS to arrange to publish your data to a limited audience.

Maintenance Schedule
See the SanGIS website under SanGIS Documentation/Business Process for a list of published public data layers. This list represents about half of the layers in the SanGIS data warehouse which is growing and changing weekly. An employee of a member agency may contact SanGIS for a list of layers in the data warehouse.

4.6.2 Data Acquisition

Definition
SanGIS acquires digital data from other sources and publishes it to the data warehouse. This includes private company data such as the Thomas Brothers page and grid layers as well as arrangements with SANDAG and other public agencies. SanGIS also participates in data partnerships such as the Countywide orthophotography programs on behalf of its member agencies.

Source Documents
Digital data is typically received via CD-ROM from companies and agencies that license data. Data from other agencies such as SANDAG is typically transmitted to SanGIS via FTP or attached to an email. Data is supplied in personal geodatabase or shape file format.

Update Procedures
Updates for licensed data or data acquired from other agencies typically takes about 2 weeks to process, depending on changes to the data structure, etc. SanGIS staff receives the data and does a visual check to compare the new data to the previous version. Fields are crosschecked between the old and new versions to see if any data structure changes have been made. The average vendor data does not have user-friendly field names so data massaging is always a part of the acquisition process.

Attribute Processing
SanGIS staff drops unnecessary fields, renames fields and adds descriptive fields when appropriate before publishing the acquired data.

Data Integrity & Accuracy Standards
SanGIS staff performs limited data integrity checks prior to accepting licensed data. Sometimes data is delivered in a different coordinate system or projection than what was ordered. We have also found errors causing us to reject the data supplied by vendors.

Quality Control
After the SanGIS analyst believes the layer is ready for update, the data layer is passed to another staff to check the data for standards and quality. Any questions or problems are resolved and a final version is sent to the SanGIS Database Administrator to update the database. The Database Administrator may reject the layer, change the layer name, or change the attribute names. These issues will be resolved between the SanGIS analyst and the DBA.

Maintenance Schedule
Licensed data is usually updated annually upon payment of the license fee. Data acquired from other agencies is updated on demand.

4.6.3 Metadata Management

Definition

The word metadata means "data about data". SanGIS has gone to maintaining the metadata with the data in the SanGIS data warehouse. The metadata was stored in an Access database. Because the data warehouse is a collection of data from contributing City and County departments, we depend on the departments to supply metadata for their contributed layers. SanGIS is now requiring the metadata to accompany the data as an XML file. The metadata is submitted as part of the data shape file or geodatabase. This file is loaded in the SanGIS SDE database and enables any user of the data to readily view the metadata when accessing the data. The user simply right clicks on the layer → clicks on Data → clicks on View Metadata. The XML metadata is replacing the metadata stored in the Access database and therefore the metadata in the Access database is no longer published. Instead a list of layers is maintained and periodically updated. This list can be found on the SanGIS website under SanGIS Documentation/Business Process.

Source Documents

A Metadata Requirement document has been created to assist those supplying data. It identifies all required information needed for the data to be added to the data warehouse. The important thing to know is that all data submitted must have the metadata completed according to the Metadata Requirement document! This document can be accessed on SanGIS website under SanGIS Documents/Business Process Documents or by contacting SanGIS.

Update Procedures

Since the metadata now accompanies the data and can be viewed by all users of the data, it is no longer necessary to check the metadata catalog for accuracy, update it, and publish it. Each time a data layer is submitted to SanGIS to be added to the data warehouse, the metadata is checked for accuracy and completeness. If information is missing or not accurate, the person who submitted the data is contacted to gather that information or asked to resubmit the metadata (XML file) once it has been completed.

Attributes

SanGIS metadata includes the map projection, coordinate system, data collection or conversion method along with other general information about the map layer. We also attempt to capture descriptive information for each attribute and each code and the source of the descriptive information.

Data Integrity & Accuracy Standards

It is necessary to verify the metadata catalog against the data warehouse database for layer additions, changes to layer names, deletions, and changes to attributes annually.

Quality Control

See above.

Maintenance Schedule

The metadata catalog is periodically published electronically on the SanGIS website.

5.0 SANGIS DATA ENVIRONMENTS

SanGIS utilizes three distinct and separate environments for GIS databases: 1) Operational; 2) Shared; and 3) Public. Each level is optimized for a specific use. All SanGIS data is stored in Oracle databases. The purpose and contents of each data server is described on the pages that follow. The triangle below is used to illustrate how the data moves from a detailed operational environment that might include multiple business tables associated with maps, to the shared environment for internal member use, and finally to the public environment. The data is massaged along the way to optimize usage.
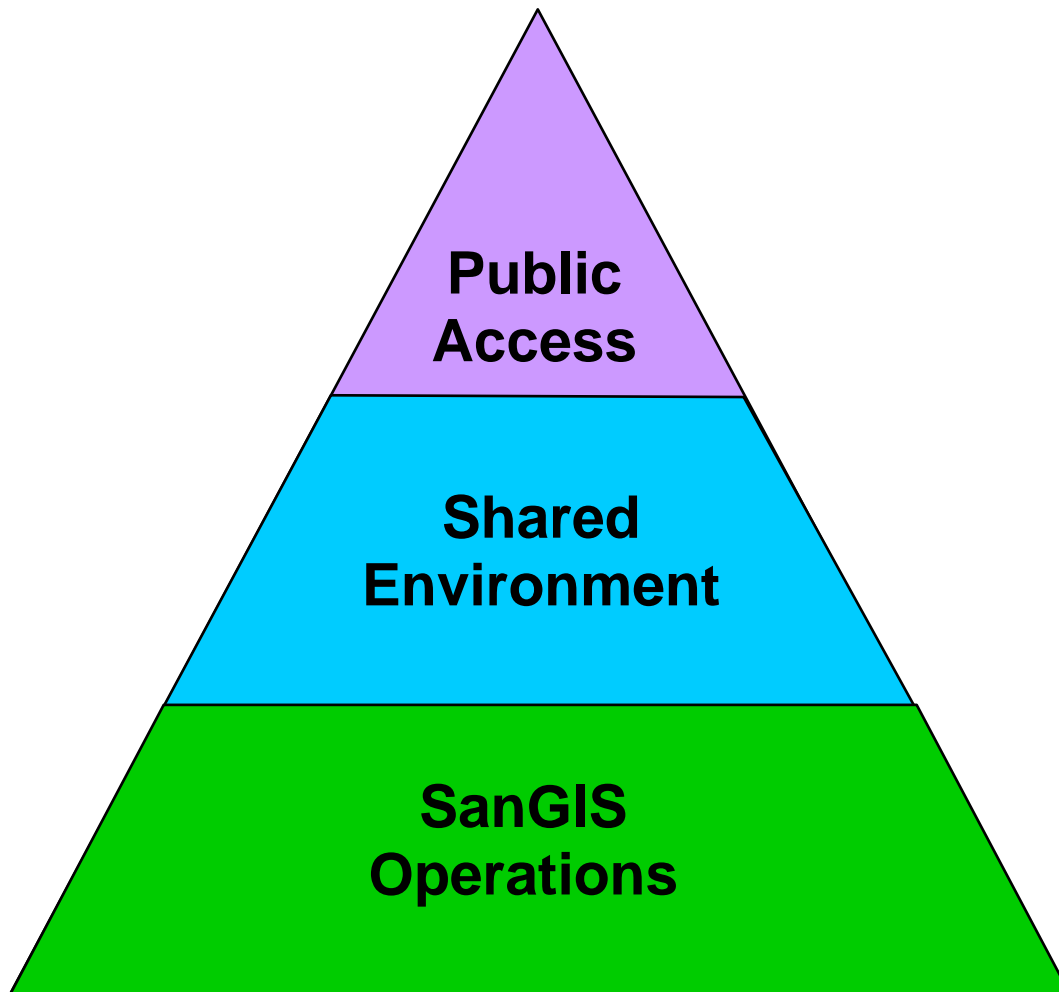
5.1 OPERATIONAL ENVIRONMENT

The SanGIS Operational Environment is defined by the following characteristics:

- Most detailed and complete data with access limited to only SanGIS staff for all operational systems
- Data structure designed and tuned to support operational systems (read/write access)
- May include many attributes not needed by other departments or not appropriate to be fully shared (eg. sensitive/secured data)
- SanGIS operational data includes landbase, federal census, zip code, and other regional layers
- SanGIS Operational format includes several tables related to many other GIS layers/processes
- Many departments also maintain their own operational databases that are periodically supplied to SanGIS for publishing to the Shared Environment


SanGIS staff

Operational
Database
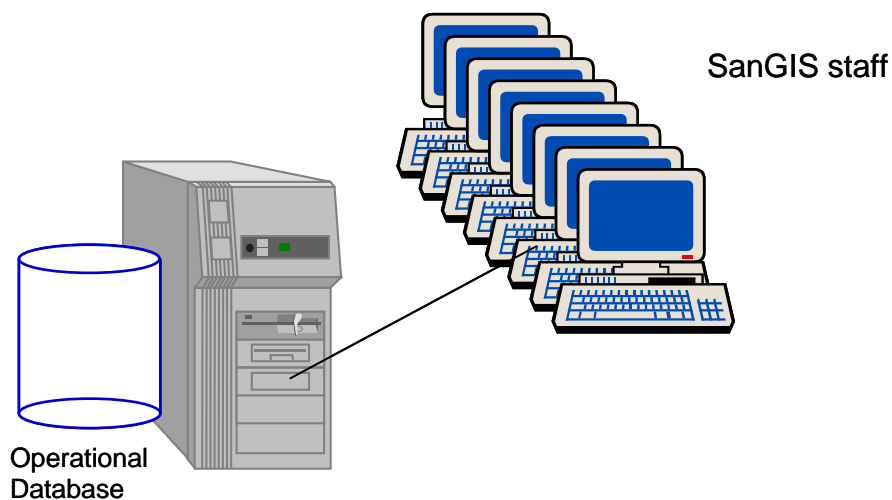
The SanGIS Operational Environment (Landbase Maintenance) server is a HP Proliant DL380 called "*Vulcan*". It serves ArcGIS SDE software for 6 to 8 editors and hosts an Oracle database (read/write). This server also executes several data publishing jobs.

.2 SHARED ENVIRONMENT

The SanGIS Shared Environment is defined by the following characteristics:

- Represents operational data in simplified form
- For internal use within the City, County, SDDPC, and SANDAG
- Some operational attributes removed
- Some descriptive fields added
- Sensitive data scrubbed
- Data structure designed and tuned to support read-only access
- Data loaded weekly from SanGIS operational database
- Data mostly gathered from City and County departmental systems
- The shared database contains approximately 450 GIS layers
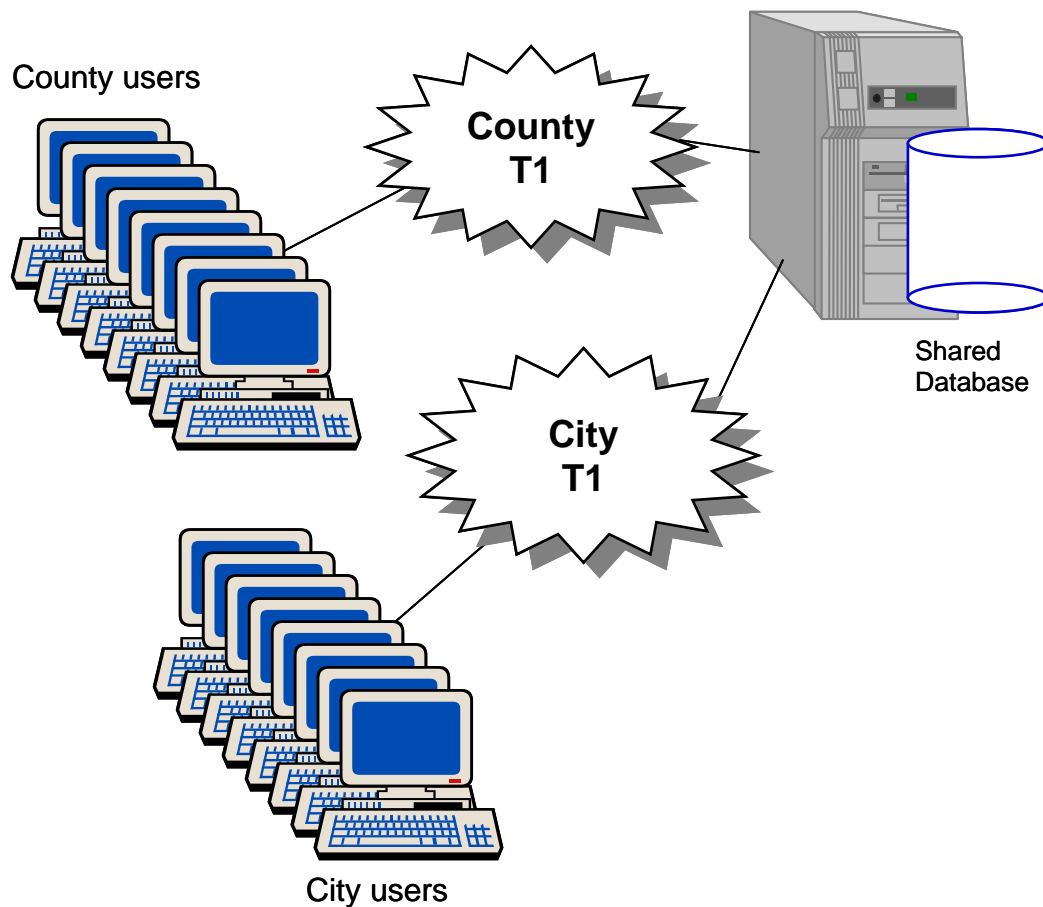
The SanGIS Shared Environment server is a Sun E450 named *SanGIS*. The server hosts SDE data and client licenses for over 800 Oracle users. Users have access to the read-only Oracle database with over 450 map layers. The environment also provides shapefiles, coverages and raster data sets.
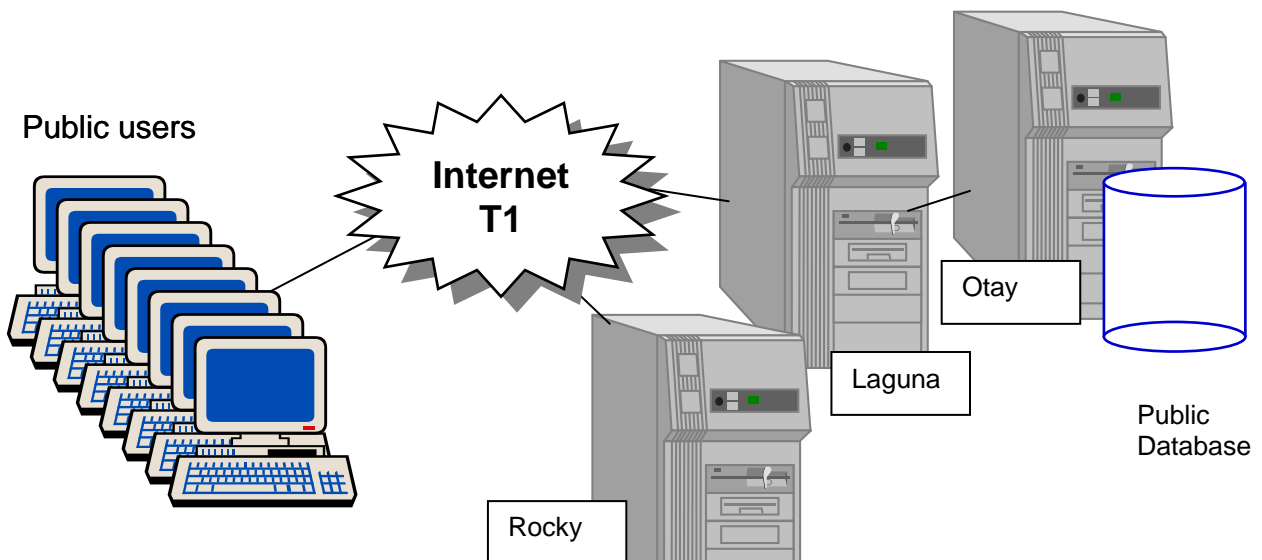
5.3 PUBLIC ENVIRONMENT

The SanGIS Public Environment is defined by the following characteristics:

Interactive Mapping
- Shared data in simplified form
- For use by general public
- Some layers and attributes removed
- Further data scrubbing
- Data structure designed and tuned to support read-only Internet applications
- Data loaded from SanGIS shared server
- The public database contains approximately 100 GIS layers

FTP Data Download
- Shared data in simplified form
- For use by general public
- Some layers and attributes removed
- Data that is updated from Landbase Maintenance weekly is extracted from the Shared Environment (SanGIS) quarterly.
- Other layers submitted from the City, County and other sources are updated at the time they are updated in SanGIS shared environment

Public users

Internet T1

Otay

Laguna

Rocky

Public Database

The SanGIS public environment that supports the Interactive Mapping includes a web server (*Laguna*) and an Oracle data server (*Otay*). Both are HP Windows 2000 servers. *Laguna* hosts ArcIMS software for interactive mapping. *Otay* hosts a read-only Oracle database with about 100 map layers. *Rocky* hosts FTP public download of about 200+ GIS layers. *Rocky* is a Windows 2003 server.

6.0 POLICIES, PROCEDURES AND PRACTICES

Data Ownership
SanGIS assumes ownership of all geographic data created by staff of the County and City of San Diego regardless of how the data creation was funded. The SanGIS (and formerly RUIS) philosophy has been that the whole is more valuable than the sum of the parts. Millions of dollars have gone into the creation and maintenance of the SanGIS landbase as a City/County shared asset. This landbase laid the foundation and facilitated creation of many other data layers. All data layers are shared and jointly owned by the SanGIS members.

Data Licensing
All geographic data created by SanGIS, County or City staff is no longer licensed through SanGIS. The licensing of data was removed when the Board of Directors in 2007 required SanGIS to provide the data for free rather than sell the data. This was in response to a ruling by the State Attorney General.

Data Release
Geographic data from SanGIS's website under 'Download GIS Data' has been deemed not sensitive by the City or County, so it is available for free public download. There are over 200 layers available for download. Third party vendor data are subject to specific licensing restrictions defined by the vendor. A list of these layers can be found on the SanGIS web site under SanGIS Documentation/Business Process.

Revenue
The annual SanGIS budget is shared equally between the City and County. The respective GIS Managers determine how to allocate funding responsibility amongst their respective departments. SanGIS's budget is also supported to a lesser extent by revenue collected from mapping services. SanGIS is exploring new sources for revenue streams.

Map Requests
SanGIS provides limited free map support to member departments. Our policy is that we will continue to offer this service to the City and County at no charge as long as it is not abused. It is our expectation that most County and City staff will rely upon internal GIS support to create maps rather than depend on SanGIS support. Maps are supplied to the public based on cost-recovery. A lamination service for maps created by SanGIS is provided to the public on a cost-recovery basis and to member departments at half the public cost. See Appendix A for a price list.

Technical Support
SanGIS staff provides limited technical support to our members and clients at no charge. Some examples include SDE set-up, ArcGIS functionality, training, data usage questions, and user group support.

Adding Data Layers

New data layers are usually easily published to the ArcSDE environment. The exception would be very large files that might require the acquisition of additional disk space. If you have created a new data layer that you think will be useful to others, please contact SanGIS to arrange to have it published. Metadata must be supplied for all data layers submitted to SanGIS. Always make sure to check with SanGIS before creating new data to avoid duplications. SanGIS can also help create new data layers.

Reporting Data Problems

Please report any problems with roads or parcels to SanGIS immediately via the SanGIS online forum (http://sanweb.sangis.org/forum), by phone, email, or fax. SanGIS will research the issue and make any necessary corrections. SanGIS is ultimately responsible for the status of all data layers. While we cannot control the currency or accuracy of every data layer maintained by our members, we can determine the currency and accuracy for you by contacting the appropriate staff.   Usually departments are willing to make corrections. However, sometimes staff and funding do not allow for these updates. When in doubt, always contact SanGIS.   Please do not assume that someone already knows about the error you've found.

Web Site Updates/Enhancements

Many County and City staff support clients who use the SanGIS web site on a regular basis. If you are in this category and hear the same complaint or suggestion, please pass this information along to SanGIS, advise the caller to contact us directly, or ask them to email the SanGIS Webmaster (webmaster@sangis.org).   SanGIS will review all suggestions and complaints in order to improve our web site and provide better public service. SanGIS strives to answer every email to the Webmaster on the same day.

APPENDIX A – SANGIS MAP SERVICES PRICING

SanGIS

The San Diego Geographic Information Source

Maps-2-Go!

Custom, presentation quality maps while you wait

Choose from over 300 digital map layers in the SanGIS geographic data warehouse
to create a map that meets your needs.
Custom maps made from 8:00 AM to 4:00 PM daily.

Standard Map Pricing

Size	Dimension	Without Aerial Photos *Price each*	With Aerial Photos *Price each*	Reprints* *Price each*	Gloss Laminate *Price each*	Gloss Mount *Price each*
A	8½" x 11"	$15	$25	$10	$15	$25
B	11" x 17"	$30	$45	$15	$20	$45
C	17" x 22"	$40	$55	$20	$20	$45
D	22" x 34"	$50	$65	$25	$30	$65
E	34" x 44"	$65	$80	$30	$40	$75

* Reprints are defined as a plot of the same original map, with the same size and content.

Student Discount: $5 off *($10 minimum charge; reprints are not discounted)*

Map Library Maps: View and print maps created by County & City staff.
 Free viewing online at **www.sangis.org.** Reprints: **$35** each

Self Service Maps: Create your own map using ArcMap on the SanGIS Public Access PC
 50% discount *(reprints, laminating or mounting are not discounted; no SanGIS staff support)*

Digital Map Images: **$45** each (BMP or JPEG format). **$10** for reprint in PDF format.

Data Extracts and Custom Mapping: **$100 per hour**
 Extracts may be shapefile(s) or DXF file(s) on DVD or CD

Mailing Tubes: **$5.00** (large), **$3.50** (small)

We will be reviewing this schedule often and making adjustments as best we can to meet your needs while still recovering our actual
cost. We are also compiling a list of County and City departments that perform similar functions and may have services and/or fees
that better meet your needs.

For further information contact SanGIS:
5469 Kearny Villa Road, Suite 102
San Diego, CA 92123
Phone: (858) 874-7000

Effective January 1, 2009

Appendix B – SanGIS Monthly Report Example

Maps & Data Extracts	
Maps Created for Public	138
Data Extracts for Public	31
Maps Created for City Staff	6
Data Extracts for City Staff	0
Maps Created for County Staff	21
Data Extracts for County Staff	0
Landbase Maintenance	
Subdivision Maps Processed	47
New Lots Added	614
Lots Processed within Goal (%)	100%
Parcel Cuts Processed	116
New Parcels Added	1718
Parcels Processed within Goal (%)	80%
New Road Segments Added	153
Landbase Corrections Processed	38
Corrections Processed within Goal (%)	90%
Phone Calls & Emails	
Information & Support Phone Calls	295
Website Assistance Phone Calls	27
Webmaster E-mails	33
Data Warehouse	
Data Warehouse Additions	5
Data Warehouse Updates	128
SDE/Oracle Account Adds/Deletes	10
New FTP User Accounts	1
Availability (%)	100%
Web Site	
Website Hits	753,890
Website FTP Data Downloads	1579
Website Updates Completed	2
Website Data Updates Completed	26
Interactive Map Service Interruptions	3
Website Availability (%)	100%
Wide Area Network	
Network Service Interruptions	0
Network Usage (%)	2%